RESTRICTED CIRCULATION

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Agricultural Memorandum No 777

Sheep P.G.E. - use of liver-fluke parameters

L P Smith

Fluke index parameters are prepared regularly, so that those for the six sample stations (Ag Mem 775), namely Cockle Park (Boulmer), Ilkley, Shawbury, Exeter, Cranwell and East Malling, are available for P.G.E. forecasts,

with notation

A = weighted return date, maximum 10

B = weighted rain days in May

C = weighted Liver Fluke Index in June plus 2 x weighted Liver Fluke Index in July

Note: Liver Fluke Index for month is the number of rain days multiplied by the term [5+ rainfall (in inches) - potential transpiration (in inches)]

Then on a 1-8 scale, on 1954-69 data, we have:-

Disease rating = $0.27A + 0.062B + 0.03C - 3.6$ (1)
with a multipile correlation of 0.9744 and partial correlations 0.795, 0.475 and 0.95.

Use of Wet days instead of Rain Days

A rain day is one with 0,2 mm (0.01 in) or more, but a wet day is one with 1.0 mm (0.04 in) or more. Rain days are used in the Fluke Index, but it might be possible that the threshold value of 0.2 mm is too low and that wet days would be more significant. The previous analysis was therefore repeated, using the notation

A = weighted return date, maximum 10

B^1 = weighted wet days in May

C^1 = as for C in previous formula, but modifying the Fluke Index by use of wet days.

Then on 1954-69 data

Disease Rating = $0.28A + 0.093B^1 + 0.038C^1 - 3.2$ (2)
with a multiple correlation of 0.9785 and partial correlations 0.83, 0.55 and 0.96.

As expected, there is a slight improvement in accuracy, but it is hardly significant on an operational scale and does not justify the extraction of data additional to that already available. The results are shown in the Appendix.

Any comments or suggestions on this paper should be referred to the author.

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APPENDIX

Year	Disease Rating	Forecast (1)	Forecast (2)	Probable Advice	
1954	6	5.9	5.5	Above average	Correct
1955	1	0.7	1.0	Low	Correct
1956	6	6.4	6.5	High	Correct
1957	3	3.9	3.4	Below average	Correct
1958	7	7.1	7.4	High	Correct
1959	1	0.1	0.3	Low	Correct
1960	8	7.5	7.7	High	Correct
1961	1	1.5	1.7	Low	Correct
1962	3	3.0	2.7	Below average	Correct
1963	5	4.4	4.4	Above average	Correct
1964	2	2.7	2.8	Below average	Correct
1965	7	6.6	7.3	High	Correct
1966	5	4.1	4.4	Above average	Correct
1967	2	1.9	2.1	Low	Correct
1968	5	4.6	4.5	Above average	Correct
1969	1	1.4	1.3	Low	Correct
Independent check					
1970	1	3.8	3.6	Below average	Near Miss
1971	3	3.0	2.6	Below average	Correct
1972	4	5.5	4.8	Above average	Near Miss
1973	5	5.0	5.4	Above average	Correct
1974	6	4.1	4.4	Above average	Near Miss
1975	1	1.1	1.4	Low	Correct